Attorney Docket Number: 42390P10698

CLAIMS

We Claim:

- 1. A method comprising:
- 2 providing a substrate; and
- introducing oxygen to a carbon doped oxide precursor in the presence of said
- substrate for deposition of a carbon doped oxide film on said substrate.
- 2. The method of claim 1 wherein said carbon doped oxide precursor is selected
- from a group consisting of tetramethylcyclotetrasiloxane, a precursor having a formula
- of H_x Si $(CH_3)_{4-x}$, and a precursor having a formula of $(CH_3)_x$ Si $(OCH_3)_{4-x}$.
- 3. The method of claim 1 wherein said oxygen is selected from a group consisting
- of ionic oxygen, molecularly stable oxygen, elementally stable oxygen, and ozone.
- 3 4. The method of claim 1 wherein said introducing comprises adding an inert
- background gas in the presence of said substrate to provide a volume filler for said
- 5 deposition of said carbon doped oxide film.
- 5. The method of claim 1 wherein said introducing is via a chemical vapor
- 2 deposition apparatus.
- 1 6. The method of claim 1 wherein said carbon doped oxide film has a dielectric
- constant of less than about 3.0.

- 1 7. The method of claim 1 wherein said deposition of said carbon doped oxide film
- 2 occurs at a rate exceeding about 5,620 angstroms per minute.
- 1 8. The method of claim 1 further comprising etching said carbon doped oxide film
- 2 for deposition of conductive lines, said carbon doped oxide film to act as an inter-layer
- 3 dielectric between said conductive lines
- 1 9. A method of forming a carbon doped oxide film on a substrate, said method
- 2 comprising:
- placing said substrate on a susceptor of a chemical vapor deposition apparatus;
- 4 introducing a background gas, a carbon doped oxide precursor and oxygen into
- s said apparatus; and
- operating said apparatus at conditions to cause said carbon doped oxide film to
- 7 form on said substrate.
- 9 10. The method of claim 9 wherein said carbon doped oxide precursor is selected
- from a group consisting of tetramethylcyclotetrasiloxane, a precursor having a formula
- of H_x Si $(CH_3)_{4-x}$, and a precursor having a formula of $(CH_3)_x$ Si $(OCH_3)_{4-x}$.
 - 1 11. The method of claim 9 wherein said conditions include a temperature of
- between about 250°C and about 450°C of said susceptor.
- 1 12. The method of claim 9 wherein said conditions include a pressure within said
- apparatus of between about 2 Torr and about 10 Torr.

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- 1 13. The method of claim 9 wherein said background gas is inert helium.
- 1 14. The method of claim 9 wherein said introducing includes a flow rate of between
- about 50 Sccm and about 200 Sccm of said carbon doped oxide precursor, a flow rate
- of between about 20 Sccm and about 200 Sccm of said background gas, and a flow rate
- of between about 1.0 Sccm and about 20 Sccm of said oxygen.
- 1 15. The method of claim 9 wherein said chemical vapor deposition apparatus is a
- 2 plasma enhanced chemical vapor deposition apparatus.
- 1 16. The method of claim 9 wherein said carbon doped oxide film is
- 2 dimethyldimethoxysilane.
- 1 17. A carbon doped oxide film to be formed on a substrate from a carbon doped
- 2 oxide precursor in the presence of oxygen.
- 1 18. The carbon doped oxide film of claim 17 to act as an inter-layer dielectric
- 2 between conductive lines deposited on said substrate following etching of said carbon
- 3 doped oxide film.
- 1 19. The carbon doped oxide film of claim 17 having a dielectric constant of less
- than about 3.0.
- 1 20. The carbon doped oxide film of claim 17 formed at a rate exceeding about
- 2 5,620 angstroms per minute on said substrate.